

REMARKS

Claim 1 has been amended to incorporate subject matter of Claim 4. Support for amended Claim 1 can be found on page 14, line 23-28 and page 15, lines 1-5. Claim 2 has been rewritten in independent form including all of the limitations of the base claim, Claim 1. Thus, no new matter has been added. Entry of this Amendment is respectfully requested. Claims 1-4 are pending.

Response to Claim Rejection Under § 103

Claim 1 is rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Applicant's Admitted Prior Art ("AAPA") of Figure 3 in view of U.S. Patent No. 6,046,464 to Schetzina. Applicants respectfully traverse.

Schetzina discloses an epitaxial substrate containing ZnO between the substrate and a collector layer. However, Schetzina does not disclose or suggest the oxygen concentration of the oxygen-containing layer.

When the amount of oxygen in the epitaxial substrate containing ZnO of Schetzina is stoichiometrically calculated¹, it is $4 \times 10^{22} \text{ cm}^{-3}$ and does not fall within the presently claimed

¹ ZnO has a density of 5.67 g/cm^3 as shown in "Safety data for zinc oxide" attached hereto.

ZnO has a molar mass of 81.4 g/mole (= relative atomic mass of Zn: 65.4 + relative atomic mass of O: 16.0).

Therefore, ZnO has a molar volume of $14.4 \text{ cm}^3/\text{mol}$ ($= 81.4/5.67$).

Therefore, ZnO contains $4 \times 10^{22}/\text{cm}^3$ of O ($= N_A: 6 \times 10^{23}/14.4$).

range of $1 \times 10^{16} \text{ cm}^{-3}$ or more and $1 \times 10^{21} \text{ cm}^{-3}$ or less. Therefore, even if Applicant's Admitted Prior Art of Figure 3 is combined with Schetzina, the present invention, as recited in Claim 1 would not be obtained.

Further, the advantageous effect of the present invention that can be shown within the range of $1 \times 10^{16} \text{ cm}^{-3}$ or more and $1 \times 10^{21} \text{ cm}^{-3}$ or less of oxygen concentration of the oxygen containing layer is disclosed at page 14, lines 23-28 and page 15, lines 1-5 of the present specification.

Thus, Schetzina and AAPA fail to render obvious Claim 1. Accordingly, withdrawal of the rejection is respectfully requested.

Response to Claim Objections

Claims 2-4 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 2 has been rewritten in independent form including all of the limitations of the base claim, Claim 1. Thus, Claim 2 is in condition for allowance. Claims 3 and 4 are patentable at least by virtue of their dependence from Claim 2. Accordingly, withdrawal of the objection is respectfully requested.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

AMENDMENT UNDER 37 C.F.R. § 1.111
Application No.: 10/554,706

Attorney Docket No.: Q90313

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

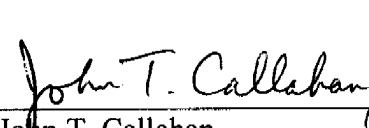
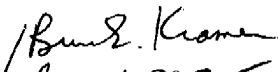
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